

Claims:

1. A process for preparing isobutene by acid-catalyzed dissociation of methyl
tert-butyl ether (MTBE),
5 which comprises
fractionating a feed mixture comprising MTBE, C₄- and C₅-hydrocarbons,
methanol, methyl sec-butyl ether, TBA and C₄ oligomers to give
 - a) a fraction a) comprising MTBE, MSBE, TBA and C₄ oligomers and
 - b) a fraction b) comprising C₄- and C₅-hydrocarbons, MTBE and methanol,
 - 10 c) dissociating the MTBE present in the fraction a) into methanol and
isobutene and
 - d) dissociating the dissociation product from c) which comprises unreacted
MTBE, methanol, isobutene and low boilers and high boilers in a column
into an isobutene-containing top product and a bottom product comprising
15 the unreacted MTBE and the major part of the methanol from the
dissociation, and recirculating the bottom product to the feed mixture.
2. The process as claimed in claim 1,
wherein
20 the C₄ oligomers, MSBE and TBA are separated off from the fraction a) by
means of a distillation in which they are taken off as bottom product.
3. The process as claimed in claim 1,
wherein
25 the C₄ oligomers, MSBE and TBA are separated off from the fraction a) by
means of a bleed stream.
4. The process as claimed in any of claims 1 to 3,
wherein

the isobutene-containing stream which has been separated off from the dissociation product from c) is fractionated in a purification column to give a bottom product consisting of pure isobutene and a top product comprising isobutene and volatile by-products.

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5. The process as claimed in any of claims 1 to 3,
wherein

the isobutene-containing stream which has been separated off from the dissociation product from c) is scrubbed with water and subsequently
10 fractionated in a purification column to give a bottom product consisting of pure isobutene and a top product comprising isobutene and volatile by-products.

6. The process as claimed in claim 4 or 5,
15 wherein
the water present in the isobutene-containing stream is removed by means of a decanter.

7. The process as claimed in any of claims 4 to 6,
20 wherein
the water present in the isobutene-containing stream is removed by means of a decanter located in the top section of the purification column.

8. The process as claimed in any of claims 4 to 7,
25 wherein
the water present in the isobutene-containing stream is removed by means of a decanter which is located at the side offtake of the purification column.

9. The process as claimed in any of claims 1 to 8,
30 wherein

the dissociation of step c) and the separation of the isobutene in step d) from the MTBE present in fraction a) are carried out in a reactive distillation column.